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NEWSLETTER

of the

Hawaiian Botanical Society

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c/o DEPARTMENT OF BOTANY
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LETTERS TO THE EDITOR

Dear Sir:

I read with great interest the April 5, 1971, "Resolution About Goats in the National Parks", which was printed in your June, 1971, issue. To give a clearer picture of the present goat situation at Hawaii Volcanoes National Park, I would like to give some first-hand information on the feral goat reduction programs of past years.

When I was first assigned to Hawaii Volcanoes National Park as Supervisory Park Ranger in February, 1965, the goat population was "guessed" at being around 5,000. As I studied the problem and learned the area, I estimated that there were approximately 20,000 feral goats.

In late 1964 and early 1965, the Park Service tested the feasibility of rounding up the goats alive and selling them to the local bidders for food. My introduction to these drives was on the second test in late February, 1965. From that time through 1967, I planned and supervised numerous roundups which lowered the goat population in the Park, provided food for the local island population, and to a large extent, paid for the "drive" costs with the sale receipts.

These roundups greatly reduced the goat population within the Park and the results were readily visible in the increased vegetation throughout the habitation areas. One drive in 1966 removed one thousand nine hundred forty seven (1,947) goats from a six square mile area of the Park. This was the result of the combined efforts of many men, particularly Kamaainas on the park staff.

In November, 1967, the park administration created a new staff organization, establishing a special position of "Wildlife Ranger", set up specifically to work on goat reduction full time. From that time on, reproduction of goats quickly skyrocketed the population back to devastating numbers. I do not mean to imply that the three men who have occupied the "Wildlife Ranger" position were completely at fault. Their basic college wildlife education was in deer management, not feral goat control, and

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they did not, or were not allowed to gain sufficient field knowledge to enable them to carry on reduction programs equal to previous years. This, coupled with the park administration's failure to give purposeful and wholehearted leadership and cooperation to the program, has resulted in the current situation.

Please be assured that this is not a new situation. The Park history for the past forty years shows identical ups and downs of the goat population, coinciding with weak and strong reduction programs. And these abrupt cycles can be directly traced to the Washington bureaucracy's constant changing of local administrations in the park, as new men are brought in from the mainland every two to four years and trained men are ordered back to the mainland.

Your resolution is a good one, but will it do any good? The present administrative policies are closely coupled with political pressures, and the local hunters seem to have the ear of our congressional delegation. The deputized hunter program probably will continue until some unsuspecting visitor is killed by a misdirected bullet.

It is my considered opinion that the only way to have an effective feral goat program, is to completely eliminate the current bureaucratic administrative situation and return the park government to properly trained, dedicated people whose prime interest is the Park and its visitors. Until a few years ago, the National Park Service was free from political pressures and thus was able to do a good job for all of the people. An example of today's gross political control is the maintenance of a General Superintendent's office in Honolulu, where there is NO National Park. The incumbent's prime purpose is political lobbying, and the present-day results appear to be hurting rather than helping our local park.

Sincerely,

/s/ Theodore L. Picco
(Supervisory Park Ranger, 1965-70)
Hilo, Hawaii
June 29, 1971

Dear Sir:

Thank you for the opportunity to comment on Mr. Picco's letter. Perhaps I can clear up some misunderstandings.

Programs to control feral goats within Hawaii Volcanoes National Park have been in existence for many years; in fact, such activities began long before the park was established in 1916. The programs have varied in scope and effectiveness (the greatest recorded number of goats removed in any one year was in 1931) and have reflected the ups and downs of available manpower and money. There appears to be no correlation at all with changing park administrators. Elements of the programs have changed, too, over the years. One of the more successful elements involves goat drives, with the captured goats sold to the highest bidder. This element has consistently been a part of the program since 1964. (A somewhat different sale-to-the-highest-bidder element was used from 1944 to 1955.) Receipts from such sales go to the U. S. Treasury and are not available as operating funds in the park itself, although they do, of course, reduce total Federal Government expenditures.

Last October, another element was added -- deputized park rangers, serving without compensation, shooting goats in specified management units and removing the carcasses from the park. Although this element has added to the effectiveness of the total program, it has also, apparently, caused some confusion. Some people have concluded that it replaces other program elements. This is not the case. It is <u>in addition</u> to

other methods of controlling goats. Other elements have been continued, and, in fact, a successful goat drive was carried out this summer.

But no programs of the past have been completely successful. The vastly fluctuating goat populations in the park testify to that. Past programs have, essentially, attacked the fruit -- large goat populations -- rather than the root of the problem. And even that attack has often been blunted, as example by the diminished programs caused by urgent competing needs for men and money during the long series of volcanic eruptions over the last several years. Now, for the past year, we have had a research biologist stationed in the park, whose training and abilities enable him to develop the information on goats and their relationship to the native plantlife that will enable us to recommend, justify and fund a rational management plan.

Resource management policy for natural areas of the National Park System is that "Native environmental complexes will be restored, protected, and maintained where practicable, at levels determined through historical and ecological research of plant-animal relationships. Non-native species may not be introduced into natural areas. Where they have become established or threaten invasion of a natural area, an appropriate management plan should be developed to control them, where feasible." We are a lot closer to such a plan than we used to be. We welcome your interest and that of Mr. Picco and all others who are concerned with resolving a problem that has been with us for many years.

Sincerely yours,

/s/ Robert L. Barrel
General Superintendent, Hawaii Group
National Park Service
Honolulu, Hawaii
September 17, 1971

Graduate Studies in Tropical Ecology, Biology and Geography

Dear Sir:

We are enclosing an announcement of the graduate courses which will be offered by the Organization for Tropical Studies in 1972 in the New World Tropics. We would appreciate it very much if the announcement could be publicized in the next edition of NEWSLETTER.

Since the OTS students are selected from universities throughout the Americas, we are desirous of getting as broad a distribution as possible of the course offerings. We will greatly appreciate your assistance in getting the information disseminated.

Sincerely yours,

/s/ J. T. Spencer, Executive Director
Organization for Tropical Studies, Inc.
August 23, 1971

Course Schedules for 1972

During its tenth consecutive year of conducting research and training programs in the American tropics, OTS in 1972 will offer four graduate courses. Three of the courses

will be scheduled in Ecology and Advanced Biology, while the fourth will be offered in Geography.

In the winter semester, January 31 to March 25, the ecology course will consist of Tropical Biology: An Ecological Approach. This will be open to 20 participants and will be conducted at the regular field sites in Costa Rica which demonstrate the whole range of tropical environmental conditions existing from sea-level to the highest altitudes in the central mountain ranges.

In the spring semester, April 17 to May 27, OTS will offer a new course in advanced biology entitled The Pine Forests of Central America. The extensive pine forests of Western North America extend south into the highlands of Central America to northern Nicaragua. This penetration of an essentially temperate zone type of vegetation into tropical regions presents opportunities to study several important ecological problems. The course will be coordinated by Dr. Gordon H. Orians, Professor of Zoology, University of Washington, assisted by a staff of full-term and visiting scientists. The training will be conducted entirely in Guatemala and Honduras.

In the summer semester from July 3 to August 26, two courses will be offered in Costa Rica. One of the courses will be a repeat of Tropical Biology: An Ecological Approach, while the second will be a course in Geography, a study of Man's Impact on Tropical Ecosystems in Costa Rica, Past and Present. This course is designed to give the student field experience in problems associated with man's interaction with tropical ecosystems. Emphasis will be placed on the ways that man has settled and utilized the various environments in Costa Rica and the impact that he has had on such renewable natural resources as natural vegetation, soils, and native animal life in that country in depth. The course will be co-coordinated by Dr. Robert C. West of Louisiana State University and Dr. Jonathan D. Sauer of the University of California at Los Angeles. They will be assisted by a staff of two visiting scientists.

A credit of 8 graduate semester hours may be earned in each of the listed courses. The earned credit will be certified to the student's home institution through the University of Costa Rica.

Those students who are selected for participation in the courses will have their expenses paid largely under a grant from the National Science Foundation. Only graduate students and recent post-doctoral faculty are eligible for consideration as participants. Application forms may be obtained from the North American Office of the OTS at 5900 S.W. 73rd Street, South Miami, Florida, 33143. The deadlines for filing applications for each semester are as follows: Winter: November 15, 1971; Spring: January 15, 1972; Summer: April 1, 1972.

IMPORTANT PAPER

N A T I V E H A W A I I A N P L A N T S

by L. W. Bryan, Deputy State Forester

This paper was given as a talk by the author to the Garden Club, Honolulu in 1957. He reproduced it as a written report, June 5, 1960. Recently, Dr. George Gillette suggested it for publication in the NEWSLETTER because it exhibits a deep awareness of the need to preserve native plants at a time when the subject was much less popular than it is today. The paper has been annotated and slightly revised by the author to up-date a few changes. He retired from the Hawaii Division of Forestry ten years ago and is now a Forestry Consultant at Kailua, Kona, Hawaii. EDITOR.

Why are so many of them so rare?

When Captain James Cook first landed in Hawaii, he found the native plants much the same as they were when the Hawaiians arrived several centuries before him. The Hawaiians, of course, did disturb the native forest but not to any great extent. They did harvest Koa for their canoes; other trees for house building and fuel; the Kauila for their Oos and Spears; and the Hau for their outriggers. Some trees were killed by girdling in order to let in the sunlight to areas which were planted with their upland crops such as sweet potatoes, pia, dry-land taro, banana and so forth. This destruction was minor in nature and did comparatively little damage to the native forest as compared to what happened after Cook arrived.

Cook brought with him the first of the grazing animals--goats. Vancouver followed a few years later with sheep and cattle; and horses arrived about 1800. Those who followed Cook introduced a new type of agriculture. Many new insects and diseases came with them. Fire was used to improve the range and clear land. As a result of these and other factors, considerable areas of native forest were destroyed. Of all the introduced enemies of our native flora, cattle appear to have done the most damage. However, insects, plant diseases and even introduced rats have assisted in this destructive work; and, of course, man with his machinery and fire, has taken a leading part. Our native plants, much the same as the native Hawaiians, had built up no immunity to these new enemies. Such pests as mealy bugs, red spiders, leaf hoppers and others, lacking natural control, have had a "field day" with some of our native plants.

In an attempt to preserve some of the rare native plants, there have been established a number of native arboreta which contain, for the most part, trees. The smaller plants, which are equally interesting, have not received the attention that some of their larger brothers and sisters have. On Maui, the late D. T. Fleming, who was extremely interested in the preservation of our native plants, established an arboretum at Puu Mahoe above Ulapalakua Ranch house. On Oahu, a number of native species have been planted at the Keaiwa Heiau Park area above Aiea. On Hawaii, the Division of Forestry has established six areas located under various climatic conditions in which a total of 90 different species of native plants, principally trees, have been planted out. These areas are listed herewith. It will be noted that they are spread out over the island. They are located at the following points:

1. Lava Tree Park in Puna, elevation of 600 feet, average rainfall of 125 inches per year. This area is located in the 1790 Lava Flow and contains 35 different species.

2. Akaka Falls Park, District of South Hilo, elevation 1,200 feet, rainfall 250 inches. This area is an ancient soil formation on the slopes of Mauna Kea and was formed many thousands of years ago. It contains 17 different species.

3. Manuka Park, District of Kau, elevation of 1,750 feet, rainfall 60 inches. This is located on the lower slopes of Mauna Loa on an old 'pahoehoe' flow with a fair cover of soil. Each hole for tree planting has to be carefully prepared and the pahoehoe underneath broken up with a jack hammer to insure good drainage. This area contains 66 different species.

4. Kaupulehu Forest Reserve, Section B, North Kona, elevation 2,000 feet, rainfall 25 inches. This is a fairly recent 'aa' flow and appears to be the best location we have. Native trees seem to thrive in this type of formation. In addition to the species we have planted, there were 12 different kinds of native trees growing there, among which are two trees of the rather rare Kokio. In this area, we have planted 21 additional species.

5. Koaia Tree Sanctuary, District of South Kohala, elevation of 3,100 feet, rainfall 22 inches. This area was selected and fenced in order to preserve a few specimens of this rapidly disappearing species. As you know, the Koaia is closely related to the native Koa, but differs from it in that the seeds are placed differently in the pod. The Koaia produces a much harder wood although it does not attain the large dimensions that the Koa does. This arboretum is located in an area (Kawaihae Uka), which was formerly famous for the large number of native plants found there. Due to cattle, they have practically all disappeared.

6. Puu Huluhulu, District of North Hilo, elevation 6,700 feet, rainfall 25 inches. This arboretum is located on an old cinder cone, one of the last to be formed on Mauna Kea before it became dormant. It was on the slopes of this hill that we discovered two plants of the rare native Laukuku, Solanum incompletum, a small tree belonging to the tomato family.

All of our arboreta are protected from damage by stock. Where ever necessary, fences have been constructed.1/ In addition to our plantings, the Department of Transportation, Division of Highways, has planted out 200 native trees representing several different species along the Federal Highway in North Kona near the Huehue Ranch. They plan to add to this number as time goes on until this seven miles of roadside has been completely planted. (Note by author: this project was never completed.)

Additional areas could well be set aside and planted out not only to native trees, but also to some of the rare herbs and smaller plants. On Oahu, where the population is heavy, additional areas could well be used. Collections of native plants should prove to be a tourist attraction as well as of educational value to our own citizens. The Bishop Museum has a few native plants growing in their "patio" and is planning to add to their collection in the near future. I recall that some years ago, the Kamehameha Schools were furnished with a collection of native trees from Hawaii.

During the period which I have lived on Hawaii, a number of native plants have disappeared. The Mehame, Drypetes phyllanthoides, which Dr. J. F. Rock discovered in South Kona, is now extremely rare. Fortunately, it can still be found on Oahu in the Waianae Range. Here it reaches a large size, probably the largest tree that ever grew on Oahu. Trees still alive can be seen which, in their prime, measured as much as six feet in diameter.2/ Recently (1969) a large specimen has been found for the first time in North Kona.

The Holei, Ochrosia sandwicense, could still be found on Hawaii when I first arrived. Today it is gone. However, there are still a few trees on Maui. From these few remaining specimens, we have been able to secure seed which proved fertile. We now have this species growing in several of our arboreta. Also in the Volcanoes National Park where three trees have grown and are now producing seed.

1/ Editor's note: The first three of the above-named six units are now managed by the Hawaii Division of Parks, Recreation, and Historic Sites. These are maintained in a cultivated condition. The Division of Forestry has jurisdiction over the remaining three. On numbers 4 and 5, the fences have been kept intact. Most of the indigenous plants remain alive and thrifty. Some have regenerated and spread despite encroachments by non-native grasses and other plants. At number 6, Puu Huluhulu, the fence has been damaged by excavating for cinders and the site is no longer protected from feral animals.

2/ The late George C. Munroe made a longhand note that Charles Judd had one in his arboretum on St. Louis Heights. Ed.

The dry-land gardenia, Nau, Gardenia brighami, has, with the exception of one tree, disappeared from the Island of Hawaii. This one remaining tree is so poor and weak that it is barely alive and has failed to produce flowers or seed during the past ten years.3/ Attempts to propagate it from cuttings have met with failure. Ten years ago, there were still a few trees of this species growing along the roadside on West Molokai. In order to protect and preserve them, a fence was constructed around them. In spite of this fence, the trees all died. We were gratified to learn that a few specimens are still alive on the Island of Lanai. Thanks to the efforts and cooperation of Mr. and Mrs. Alex Desha of Lanai City, seeds have been obtained and plants raised in our nursery. Young trees have been planted out, and are now growing in our collections, Manuka Park.

The rare Haukuahiwi, Hibiscadelphus giffardianus, has an interesting history. The original tree, from which the genus takes its name (meaning brother to the Hibiscus), was discovered by the late Walter M. Giffard, growing in the Kipuka Puaulu (now a part of the Hawaii National Park). This was the only tree of this species ever found. It was given its specific name in honor of the man who found it. In spite of all of our efforts, over a period of over forty years, there are today less than a dozen of these trees in existence. It is producing fertile seed in Volcanoes National Park (1971).

The above examples serve to illustrate the difficulties experienced by those who handle native plants. They are interesting to work with, but present many difficulties and disappointments. Seed gathered here on Hawaii has been sent to botanical gardens in other parts of the world. Kew Gardens in England now has quite a collection of native Hawaiian plants which appear to be flourishing. A photograph sent to us from the botanical gardens in Edinburgh, Scotland, indicates that some of our highland native plants (Mountain Pilo, Silversword, and Naenae) are happy there. In fact, they seem to grow better there than they do here at home. (I saw them when I visited these two gardens in 1966.)

You may well ask, why attempt to preserve these rare trees and other plants as many of them have no known economical value? The same question may be asked of other plants and animals which we attempt to preserve. The Nene or Hawaiian goose is one; the Bison and the Whooping Crane are others. For educational and other purposes, it appears desirable to attempt to preserve such things. Far better to have them alive than to see them in a museum or a dusty herbarium. Can any use be made of them? The answer is "yes". A number of our native plants do have some economic value while others are extremely attractive and lend themselves to landscape work. One of our most attractive trees is the Ohe, Tetraplasandra sp. It is not common and so not well known. This tree has large attractive, compound leaves and has been planted extensively in southern California. There are probably more specimens of this tree in California than we have here in Hawaii. As a young tree, it makes an attractive pot plant and hundreds have been sold as such in California.

Among other native plants that can be used for landscaping are:

Ulei (Osteomeles anthyllidifolia) - This makes a very good hedge. On Hawaii, this plant, which is normally a scandent shrub, reaches tree size. It was used by the natives to manufacture bows, and these were used only the the 'alii' for sport--the shooting of the tree rats being the principal use made of them. This plant appears to be the only native tree in Hawaii belonging to the rose family. It has a fine compound glossy leaf with white flowers which turn into attractive small white apples.

3/ 1971. It is now dead.

Alahee (Camthium odorata) - This is a small shapely, compact tree with bright green, glossy leaves and very sweet scented flowers. It grows well in both dry and moderately moist locations.

Pukiawe (Styphelia sp.) - It has small leaves, white, pink and dark red fruits. It resembles heather somewhat when not in fruit and does well from sea level to 10,000 feet.

Pilo (Coprosma sp.) - A handsome tree with red and orange fruit; Coprosma montana, which grows high on the mountain, being particularly attractive.

Hibiscus - There are several native Hibiscus that should be used more. They come in three shades; yellow, red and white. Some of these native plants are the ancestors of today's attractive hybrids.

Loulu (Pritchardia sp.) - With one or two exceptions, these palms are all native to Hawaii. With their large, fan-shaped leaves, they are extremely beautiful and should be used a great deal more. Seed is easy to obtain and they grow well from sea level to 5,000 feet.

Some other plants useful for landscaping are: Tree Ferns (Cibotium sp.); Nukuiwi (Strongylodon lucidum) - this vine is of the same genus as the Jade Vine growing in the Foster Gardens and it takes its name from its resemblance to the bill of 'Iiwi' Bird; Ape (Alocacia sp.); Ginger (Zingiber sp.); Wiliwili (Erythrina sandwicensis); the Lobelias, Cyaneas and Clermontias produce some very attractive plants which are suitable for the most part to moist locations; Halapepe (Pleomele aurea); Ti (Cordyline terminalis); Beach Morning Glory (Ipomoea sp.); Lama (Diospyros sandwicensis); Lauhala (Pandanus odoratissimus); Koae (Musa koae), a variegated type, which is not only extremely ornamental but also produce edible fruit of outstanding quality; Kou (Cordia subcordata), which is a well-known, attractive, small tree that does well near the beach and produces the best known wood for calabashes. It should be planted in greater quantities. Ohia (Metrosideros collina var. polymorpha) is an attractive tree, the flowers of which are light yellow to dark red. On Oahu, it is commonly called Lehua, which is actually the name of the flower and not of the tree. Maile (Alyxia olivaeformis) - this sweet scented vine has long been in favor for leis. It is easy to grow and should be planted extensively.

The above is not a complete list but it does indicate that there are many native plants that may be used in landscaping work.

In addition to the above, there are several useful native plants which include Pia (Tacca pinnatifida), which is a source of starch. Of interest is the fact that the University of Hawaii has been working with this plant extracting a rare ingredient from it which only occurs in minute quantities. The Hawaiian Akoko (Euphorbia lorifolia) produces a very fine latex and can be manufactured into a high grade of rubber.

What can people do to assist in this work of preserving the native trees and other plants? Well, it all costs money. Increased appropriations with funds earmarked for this project would help. Those interested can assist by planting out and caring for some of these plants, and making sure that they do not disappear and die. Many of them will do well in your own grounds.

EVENTS

Summer Foray

The annual summer foray was held at Harold Lyon Arboretum on July 5, 1971. The program was planned and lead by Dr. Yuneo Sagawa of Horticulture. He was assisted by Robert Hirano and Kenneth Nagata. About 25 persons attended.

Demonstrations at State Fair - August 25 - Sept. 6

Thanks to his many willing helpers, our President, Ron Hurov reports that the Society had an exceptionally good booth which attracted perhaps as many as 15,000 visitors. His helpers included Bea Krauss, Jean Sawyer, Mabel Babcock, Jim Barrows, John Porter, Milton Manhoff, Dr. Adrian Brash, Bill Cook, and Yuneo Sagawa. As a backdrop, the booth had posters of plants and their uses. On display were publications, plants, and plant parts (such as fruits and roots). Exhibit materials were supplied by Botany, Horticulture, Foster Garden, H.S.P.A., Division of Forestry and others. Two hundred copies of the NEWSLETTER were distributed as well as 900 applications for membership in the Botanical Society. Depending upon the financial success of the Fair, the Society may receive a cash stipend for its contribution.

Twelfth Pacific Science Congress

General Report

The Twelfth Pacific Science Congress of the Pacific Science Association was held at the Australian National University, Canberra, A.C.T. from August 18 to 27, 1971. The Australian Academy of Science served as the host institution. Sir Macfarlane Burnet was President of the Congress, and Sir Otto Frankel was Secretary-General and Chairman of the Organizing Committee.

The Congress was organized in four sections:

A. Productivity and Conservation in the Pacific.

B. Man in the Pacific.

C. Environment 1 Quality and Resource Management: Political, Legal and Administrative Realities.

D. Geological Structure and Mineral Resources in the Pacific.

A series of symposia were organized within each section. For example, under section A there were ten separate symposia with such titles as: Crop productivity; Survey and assessment of biological and economic production from forests; Exploration and conservation of plant genetic resources; Problems of nature conservation in the Pacific.

There were a total of 1,029 participants, and 448 papers were presented at the Congress. There were about 30 participants from Hawaii, and the following botanically-oriented papers were among those presented by Hawaii participants:

"Prehistoric agricultural systems in Oceania", by D. E. Yen

"Hawaii's forest resource needs, production potentials, and constraints", by R.E. Nelson

"Pineapple productivity", by J. B. Smith

"Productivity of tropical benthic economic algae in the Pacific", by M. S. Doty

"Tropical marine algal ecology", by M. S. Doty

"Interrelationship between marine and terrestrial ecosystems in Polynesia", by M.S. Doty

"The effect on fauna of the loss of forests in New Guinea", by J. L. Gressitt

"Conservation problems in Hawaii", by C. H. Lamoureux

As one who attended many of the symposia in sections A and C, I was particularly struck by the similarity of environmental problems reported by speakers from many different countries, and by the fact that progress toward the solution of such problems seems to be occurring equally slowly in all of them.

The Congress was well-organized and the Australians were excellent hosts. A series of post-Congress tours to various parts of Australia and to New Guinea were organized for the week after the Congress closed, and shorter trips were available during the weekend that the Congress was in session.

The Thirteenth Pacific Science Congress will be held in Vancouver, British Columbia, in 1975.

C. H. Lamoureux, Botany Dept. U. H.

The Forestry Program

The Congress got off to an inspiring start at Canberra, Australia on August 18, 1971 when Congress President Sir MacFarlane Burnet reminded the delegates of the far-reaching impacts of western civilization on the Pacific Basin people and resources during the 18th and 19th Centuries. Seeds of change were sown then that had both immediate and long-run drastic effects. He reminded us, too, that life and evolution are only concerned with success.

The Standing Committee on Forestry submitted a report to the Pacific Science Council. This report touched on several topics of interest since the 11th Congress, including: the vast increase in imports of forest products by Japan; the World Symposium on Man-Made Forests; the high interest in planting tropical conifers; and the need to preserve forest types and species.

Symposium A5 was concerned with the survey and assessment of biological and economic production from forests. About 25 papers were presented, on far-ranging topics. Some were concerned with the biometric tasks of measuring the forest resources. Others were concerned with analyzing resource data in terms of supply and demand, both of forest area in terms of a multiple-use resource and in terms of wood supplies as an economic resource for developing countries as well as developed countries.

Plantation forestry received a lot of attention, from ecological and economic viewpoints. There is no question that large areas in many Pacific Basin countries will be devoted to plantation forestry using exotic species. The primary incentive is their much greater productivity.

A great deal of research is underway to improve the practices of establishing and managing planted and natural forests. Tree breeding and soil nutrients are important study topics.

The active involvement of the public is increasingly affecting forest management

decisions. But this is much more apparent in affluent societies.

The Standing Committee on Forestry recommended to the Council that a Forestry Committee be continued. It also recommended that for the next Congress a forestry program be included "to cover increased productivity in its widest sense, and land-use capability classifications, as well as the preservation of the environment in the Pacific Region."

Robert E. Nelson
Institute of Pacific Islands Forestry

PROCEEDINGS OF THE SOCIETY

The following are not complete minutes--only especially significant highlights.

October 4, 1971

a. Brief discussion of burning in sugar cane fields, led by Dr. Hugo Kortschak.

b. Brief discussion of application to harvest hapuu in Conservation District on land of Bishop Estate.

c. Membership--280 but only 202 paid up to date.

d. Speaker of the evening, John Obata, Science Teacher, Kawananakoa School, Early Work in Growing Indigenous Hawaiian Plants.

PUBLICATIONS

Recent Literature

Burgan, Robert E., Wesley H. C. Wong, Jr., Rober G. Skolmen, Herbert L. Wick 1971
Guide to log defect indicators in Koa, Ohia...preliminary rules for volume deductions. U.S.D.A. Forest Service Research Note-PSW.

Burgan, Robert E. and Wesley H. C. Wong, Jr. 1971
Forest products harvested in Hawaii-1969. U.S.D.A. Forest Service Research Note PSW-239.

Carlquist, S. 1969
Wood anatomy of Goodeniaceae and the problem of insular woodiness. Annals Missouri Bot. Gard. 56:358-390.

Carlquist, S. 1969
A new species of Scaevola (Goodeniaceae) from Tahiti. Annals Missouri Bot. Gard. 56:469-470.

Carlquist, S. 1969
Toward acceptable evolutionary interpretations of floral anatomy. Phytomorphology 19:332-362.

Carlquist, S. 1970
Wood anatomy of Echium (Boraginaceae). Aliso 7:183-199.

Carson, Hampton L. 1971
The ecology of Drosophila breeding sites. University of Hawaii Harold L. Lyon Arboretum Lecture No. 2

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c/o Department of Botany, University of Hawaii
3190 Maile Way, Honolulu, Hawaii 96822

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THE HAWAIIAN BOTANICAL SOCIETY NEWSLETTER is published in February, April, June, October, and December. It is distributed to all Society members for the purpose of informing them about botanical news and progress in Hawaii and the Pacific. News contributions and articles are welcomed.

Editor Russell K. LeBarron
(Hawaii Division of Forestry)

THE HAWAIIAN BOTANICAL SOCIETY was founded in 1924 to "advance the science of Botany in all its applications, encourage research in Botany in all its phases," and "promote the welfare of its members and to develop the spirit of good fellowship and cooperation among them." Any person interested in the plant life of the Hawaiian Islands is eligible for membership in this Society. Dues, regular, $3.00 per year; college students, $2.00; students below college level, $1.00.

HAWAIIAN BOTANICAL SOCIETY
c/o Department of Botany
University of Hawaii
3190 Maile Way
Honolulu, HI. 96822

DR. F. RAYMOND FOSBERG
SMITHSONIAN INST.
WASHINGTON, D.C. 20560

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